

## Summary of Studies Investigating Manners of Death During the COVID-19 Pandemic

Reference	Location of Study Population	Death Manner; Death Cause	Pandemic Data Span / Comparison Data Span	Key Findings
Appleby L, Richards N, Ibrahim S, et al. Suicide in England in the COVID-19 pandemic: Early observational data from real time surveillance. Lancet Reg Health - Eur 2021; 100110.	England	Suicide	April - October 2020 / January - March 2020  April - October 2020 / April - October 2019  N = 13,439 RTS-recorded suicides (2020) and coroner-confirmed suicides (2016-2018)	No significant change.
Bray MJ, Daneshvari NO, Radhakrishnan I, et al. Racial Differences in Statewide Suicide Mortality Trends in Maryland during the Coronavirus Disease 2019 (COVID-19) Pandemic. JAMA Psychiat 2021; 78: 444–7.	Maryland, USA	Suicide	January 1 - March 4 2020 (Period 1); March - May 7 2020 (Period 2); May 8 - July 7 2020 (Period 3) / January 1 - March 4 2017-19; March - May 7 2017-19; May 8 - July 7 2017-19  N = 1,079 suicides	Daily suicide mortality in 2020 did not differ from the means in 2017 to 2019 for either race during period 1.  During period 2, suicide mortality increased among black residents per day in 2020 vs 0.177 per day from 2017 to 2019 and decreased among white residents per day in 2020 vs 1.224 per day in 2017 to 2019.  During period 3, suicide mortality did not differ from historical values among black residents but decreased among white residents.
Deisenhammer EA, Kemmler G. Decreased suicide numbers during the first 6 months of the COVID-19 pandemic. Psychiatry Res 2020; 295: 113623.	Tyrol, Austria	Suicide	April 1 - September 30 2020 / 2006-19  N = 905 suicides	Significant decrease in suicide numbers during the first 6 months of the pandemic compared to the respective periods of the preceding years.  When looking at the values of the first (April to June) and the second 3 months (July to September) separately, the study found a reduction for 2020 compared to the mean of the preceding years for both periods. Significance was obtained for the second period only.
Faust JS, Shah SB, Du C, et al. Suicide deaths during the COVID-19 stay-at-home advisory in Massachusetts, March to May 2020. JAMA Netw Open 2021 Jan 4;4(1):e2034273.	Massachusetts, USA	Suicide	January - May 2020 / January - May 2015-19  N = 1,004 suicides (as per table)	No significant change.

Isumi A, Doi S, Yamaoka Y, et al. Do suicide rates in children and adolescents change during school closure in Japan? The acute effect of the first wave of COVID-19 pandemic on child and adolescent mental health. Child Abuse Negl 2020; 110: 104680.	Japan	Suicide	March - May 2020 / March - May 2018-19 N = not provided	No significant change in the studied population of < 20 years old.
Kim AM. The short-term impact of the COVID-19 outbreak on suicides in Korea. Psychiatry Res 2021; 295: 113632.	Korea	Suicide	January - August 2020 / January - August 2019 N = 17,731 suicides	Suicides decreased by 6.9% in the first eight months of 2020 compared with the same period in 2019. Male suicides decreased by 10.1%, female suicides increased by 1.4%.  In the period following March, when the number of COVID-19 deaths and cases were the highest, males showed marked decreases in the number of suicides while females showed increases in March and April and a decrease in May.
Leske S, Kõlves K, Crompton D, et al. Real-time suicide mortality data from police reports in Queensland, Australia, during the COVID-19 pandemic: an interrupted time-series analysis. Lancet Psychiat 2021; 8: 58–63.	Queensland, Australia	Suicide	January 1 2015 - August 31 2020 N = 4236 suspected suicides	No significant change.
Mitchell TO, Li L. State-level data on suicide mortality during COVID-19 quarantine: early evidence of a disproportionate impact on racial minorities. Psychiatry Res 2021; 295: 113629.	Connecticut, USA	Suicide	March 10 - May 20 2020 / March 10 - May 20 2014-19 N = 74 suicides	20% lower suicide rate for the general population (versus previous year), however was 62% higher for non-white population.
Nomura S, Kawashima T, Yoneoka D, et al. Trends in suicide in Japan by gender during the COVID-19 pandemic, up to September 2020. Psychiatry Res 2021; 295: 113622.	Japan	Suicide	December 2010 - September 2020 N = 99,293 suicides	Excess suicide deaths among women in July, August and September, but not among men after rigorous consideration of past trends.
Pirkis J, John A, Shin S, et al. Suicide trends in the early months of the COVID-19 pandemic: an interrupted time-series analysis of preliminary data from 21 countries. Lancet Psychiat 2021; 8: 579–88.	21 countries	Suicide	April 1 - July 31 2020 / January 1 2019 - March 31 2020 N = 18,828 suicides (Figure 2) N = 31,088 suicides (Figure 3) N = 23,692 suicides (Figure 4)	Significant decrease in suicides in New South Wales, Australia; Alberta, Canada; British Columbia, Canada; Chile; Leipzig, Germany; Japan; New Zealand; South Korea; California, USA; Illinois (Cook County), USA; Texas (four counties), USA; and Ecuador.

Qin P, Mehlum L. National observation of death by suicide in the first 3 months under COVID-19 pandemic. <i>Acta Psychiatr Scand</i> 2021; 143: 92–3.	Norway	Suicide	March - May 2020 / March - May 2014-18  N = 965 suicides	Decreased suicides but still within ranges for random variation.
Radeloff D, Papsdorf R, Uhlig K, Vasilache A, Putnam K, von Klitzing K. Trends in suicide rates during the COVID-19 pandemic restrictions in a major German city. <i>Epidemiol Psychiatr Sci</i> 2021; 30: 1–5.	Leipzig, Germany	Suicide	January 2010 - September 2020  N = 643 suicides	Suicide rates during COVID-19 pandemic are in line with the trend in previous years.
Rück C, Mataix-Cols D, Malki K, et al. Will the COVID-19 pandemic lead to a tsunami of suicides? A Swedish nationwide analysis of historical and 2020 data. <i>Psychiatry and Clin Psychol</i> , 2020.	Sweden	Suicide	January - June 2020 / January - June 2000-19  N = 80,058 suicides	Suicide rates in January-June 2020 (when the first wave of COVID-19 occurred) were not higher than those of the corresponding period in 2019.
Sakamoto H, Ishikane M, Ghaznavi C, et al. Assessment of suicide in Japan during the COVID-19 pandemic vs previous Years. <i>JAMA Netw Open</i> 2021; 4: e2037378.	Japan	Suicide	April - November 2020 / April - November 2016-19  January - November 2011-19 / January - November 2020  N = 90,048 suicides	Suicide rates in Japan in 2020 increased in October and November for men and in July through November for women.
Tanaka T, Okamoto S. Increase in suicide following an initial decline during the COVID-19 pandemic in Japan. <i>Nat Hum Behav</i> 2021; 5: 229–38.	Japan	Suicide	November 2016 - October 2020  N = 76,626 suicides	Monthly suicide rates declined from February to June 2020. Monthly suicide rates increased from July to October 2020.
Ueda M, Nordström R, Matsubayashi T. Suicide and mental health during the COVID-19 pandemic in Japan. <i>J Public Health</i> 2021; 1-8.	Japan	Suicide	January - October 2020 / January - October 2017-19  N = 81,431 suicides	Suicides decreased during February 2020 compared to the average during the 2017–19 period. Starting in July 2020, the rate exceeded the trend of the past 3 years.
Vandoros S, Theodorikakou O, Katsadoros K, Zafeiropoulou D, Kawachi I. No evidence of increase in suicide in Greece during the first wave of covid-19. Preprint. medRxiv 2020.	Greece	Suicide	January 1 - March 23 2020; March 24 - May 3 2020 / 2015-19  N = not provided	No empirical evidence of any increase in suicides during the first wave of Covid-19 and the lockdown was found.
British Columbia Coroners Service. Illicit drug toxicity deaths in BC, January 1, 2011 – March 31, 2021; Accessed 21-Apr-2021 from <a href="https://www2.gov.bc.ca/assets/gov/birth-adoption-death-marriage-and-divorce/deaths/coro">https://www2.gov.bc.ca/assets/gov/birth-adoption-death-marriage-and-divorce/deaths/coro</a>	British Columbia, Canada	Drugs	January 1 2011 - March 31 2021  N = 9,393 illicit drug toxicity deaths	Increased deaths by drug toxicity in 2020.

ners-service/statistical/illicit-drug.pdf.				
Glober N, Mohler G, Huynh P, et al. Impact of COVID-19 pandemic on drug overdoses in Indianapolis. J Urban Health 2020; 97: 802–7.	Indianapolis, Indiana, USA	Drugs	January 1 2019 - July 24 2020  N = 4894 EMS calls (by Race/Ethn. or Zip code, Table 3)	Deaths from drug overdoses increased.
Government of Alberta. Alberta substance use surveillance system; Accessed 21-Apr-2021 from <a href="https://healthanalytics.alberta.ca/SASVisualAnalytics/?reportUri=%2Freports%2Freports%2F1bbb695d-14b1-4346-b66e-d401a40f53e6&amp;sectionIndex=0&amp;sso_guest=true&amp;reportViewOnly=true&amp;reportContextBar=false&amp;sas-welcome=false">https://healthanalytics.alberta.ca/SASVisualAnalytics/?reportUri=%2Freports%2Freports%2F1bbb695d-14b1-4346-b66e-d401a40f53e6&amp;sectionIndex=0&amp;sso_guest=true&amp;reportViewOnly=true&amp;reportContextBar=false&amp;sas-welcome=false</a> .	Alberta, Canada	Drugs	January 1 2016 - February 28 2021  N = 5,658 unintentional acute drug poisoning deaths and any apparent unintentional fentanyl related deaths	Increased deaths by drug toxicity in 2020.
Mason M, Welch SB, Arunkumar P, et al. Opioid overdose deaths before, during, and after an 11-week COVID-19 stay-at-home order — Cook County, Illinois, January 1, 2018–October 6, 2020. MMWR Morb Mortal Wkly Rep 2021; 70: 362–3.	Cook County, Illinois, USA	Drugs	January 1 2018 - October 6 2020  N = 3,843 opioid deaths	Increased opioid overdose deaths during stay at home order, declined when stay at home order ended.
Paul LA, Li Y, Leece P, et al. Bayesian modelling of opioid mortality trends: 2003-2022. Preprint. PLoS Med; Accessed 21-Apr-2021 from <a href="https://www.editorialmanager.com/pmedicine/download.aspx?id=792404&amp;guid=086c7798-4814-44a3-9ae3-2ecea3d1632b&amp;scheme=1">https://www.editorialmanager.com/pmedicine/download.aspx?id=792404&amp;guid=086c7798-4814-44a3-9ae3-2ecea3d1632b&amp;scheme=1</a> .	Ontario, Canada	Drugs	January 1 2003 - May 31 2020  N = 10,585 opioid related deaths	Spike in 2017-18 corresponds with an increase of fentanyl exposure in Ontario. Opioid-related mortality rates decreased in late 2019 but increased again throughout 2020.
Public Health Agency of Canada. Apparent opioid and stimulant toxicity deaths. Surveillance of opioid- and stimulant-related harms in Canada; Accessed 21-Apr-2021 from <a href="https://publications.gc.ca/collections/collection_n_2021/aspc-phac/HP33-3-2020-eng-3.pdf">https://publications.gc.ca/collections/collection_n_2021/aspc-phac/HP33-3-2020-eng-3.pdf</a> .	Canada	Drugs	January 2016 - December 2020 (ranges vary between provinces, territories, and types of analyses conducted)  N = 21,174 opioid toxicity deaths	Since the onset of the COVID-19 pandemic, 5,148 apparent opioid toxicity deaths have occurred (April to December 2020), representing an 89% increase from the same time period in 2019 (2,722 deaths).

The Ontario Drug Research Policy Research Network. Preliminary patterns in circumstances surrounding opioid-related deaths in Ontario during the COVID-19 pandemic. A collaboration between the OCC-OFPS, Public Health Ontario and the Centre of Drug Policy Evaluation; Accessed 21-Apr-2021 from <a href="https://odprn.ca/wp-content/uploads/2020/11/Opioid-Death-Report_FINAL-2020NOV09.pdf">https://odprn.ca/wp-content/uploads/2020/11/Opioid-Death-Report_FINAL-2020NOV09.pdf</a>	Ontario, Canada	Drugs	March 16 - June 30 2020 / December 1 2019 - March 15 2020  N = 695 opioid deaths in first 15 weeks of COVID-19 pandemic; 503 opioid deaths in 15 weeks prior to pandemic	25% increase in suspected drug-related deaths.
Boman JH, Gallupe O. Has COVID-19 Changed Crime? Crime rates in the United States during the pandemic. Am J Crim Justice 2020; 45: 537–45.	Chicago, USA Philadelphia, USA	Homicide	January 1 - May 28 2020 / January 1 - May 28 2019 (Chicago)  January 1 - May 29 2020 / January 1 - May 29 2019 (Philadelphia)  N = 383 homicides (Chicago), 282 homicides (Philadelphia)	COVID-19 lockdowns do not appear to have had any effect whatsoever on Chicago homicides and may have contributed to a 15% increase in homicides in Philadelphia in 2020 compared to 2019.
Byard RW. Geographic variability in homicide rates following the COVID-19 pandemic. Forensic Sci Med Pathol 2021; 1–3.	Australia	Homicide	January 2015 - December 2020  N = 92 homicides of 8,381 autopsies	Significant decrease in homicides since the beginning of the pandemic.
Sutherland M, McKenney M, Elkbuli A. Vehicle related injury patterns during the COVID-19 pandemic: What has changed? Am J Emerg Med 2020; 38: 1710–14.	Florida, USA Massachusetts, USA New York, USA	MVC	October 1 2019 - March 31 2020 / October 1 - March 31 2016-19  N = 158,341 collisions (resulting in injury or death)	Significantly reduced total vehicle collisions and vehicle related injuries during the pandemic.
Calderon-Anyosa RJC, Kaufman JS. Impact of COVID-19 lockdown policy on homicide, suicide, and motor vehicle deaths in Peru. Prev Med 2021; 143: 106331.	Peru	Homicide, suicide, accident (other); MVC	January 2017 - June 2020  N = 14,526 violent and accidental (i.e. non-natural) deaths of 388,772 adult deaths (2,849 homicides, 1,611 suicides, 3,366 other accidents; 6,700 MVCs)	All forms of external deaths presented a sudden drop after the implementation of the lockdown (including accidental). Decreased deaths related to traffic accidents. Decreased homicides in men. Decreased suicides in men.
Calderon-Anyosa RJC, Bilal U, Kaufman JS. Variation in non-external and external causes of death in Peru in relation to the COVID-19 lockdown. Yale J Biol Med 2021; 94: 23–40.	Peru	Homicide, suicide, accident (other); MVC	January 1 - March 15 2020; March 16 - June 30 2020; July 1 - December 31 2020 / January 1 - March 15 2018-19; March 16 - June 30 2018-19; July 1 - December 31 2018-19  N = not provided	External deaths dropped during the lockdown, suicides and homicides returned to previous levels in the post-lockdown period. Deaths due to traffic accidents dropped during the lockdown and returned to pre-pandemic levels by December 2020.

Karakasi M-V, Kevrekidis D-P, Pavlidis P. The role of the SARS-CoV-2 pandemic on suicide rates. Am J Forensic Med Pathol 2020; 42: 99–100.	Thrace, Greece	Natural, homicide 'assault', suicide, accident 'unintentional'; MVC, drowning, poisoning, other unintentional, self-harm by hanging, self-harm by firearm, other self-harm	March 1 - May 15 2020 / March 1 - May 15 2010-19  N = 96 non-natural deaths (2 assaults, 24 suicides, 70 unintentional; 21 MVC, 21 drowning, 10 poisoning, 18 other unintentional, 14 hanging, 5 firearm, 5 other intentional) of 116 deaths (20 natural)	There were no meaningful differences in the manner of death across the study periods.
Pell R, Fryer E, Manek S, et al. Coronal autopsies identify the indirect effects of COVID-19. Lancet Public Health 2020; 5: e474.	Oxford, UK	Natural, suicide; drugs/alcohol, trauma, infectious disease, COVID-19, chronic disease, other (including accidents 'other')	March 23 - May 23 2020 / March 23 - May 23 2018  N = 40 non-natural deaths (16 suicides; 18 drug/alcohol deaths, 6 trauma; 20 infectious disease, 3 COVID-19, 16 chronic disease, 86 sudden natural deaths; 7 other; based on figure in supplementary material) of 172 autopsies	Significant increase in postmortems identifying suicide. Increase in post mortems identifying drug/alcohol misuse.
Sakelliadis EI, Katsos KD, Zouzia EI, Spiliopoulou CA, Tsiodras S. Impact of COVID-19 lockdown on characteristics of autopsy cases in Greece. Comparison between 2019 and 2020. Forensic Sci Int 2020; 313: 110365.	Greece	Homicide, suicide, accident, undetermined; MVC, MI	March 17 - April 15 2020 / March 17 - April 15 2019  N = 50 non-natural manner (5 homicides, 10 suicides, 26 accidents, 9 undetermined; 17 MVCs (unclear if included in 'accidents'), 109 MI) of 231 autopsies	MVCs decreased during the first month of the lockdown. Homicides and suicides appeared unaffected.